



Fink, Charlie <charlie@lcfink.com>

things you find on line! see you Sat

10 messages

Edward McFarland <emcfar1@jhmi.edu>

Tue, Dec 9, 2008 at 5:46 PM

To: "Fink, Charlie" <charlie@lcfink.com>

the physician and sportsmedicine

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Tibial Plateau Fracture in a Softball Player

Avoiding Potentially Disastrous Delay

David M. Anderson, MD; Christopher A. Dawson, PA; Andrew J. Cosgarea, MD; Edward G. McFarland, MD

THE PHYSICIAN AND SPORTSMEDICINE - VOL 33 - NO. 3 - MARCH 2005

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In Brief: Tibial plateau fractures typically are associated with high-energy mechanisms in young patients, as in the case of this 35-year-old softball player, and with low-energy trauma in the older population. A detailed history, careful physical examination, and plain radiographs constitute the essential initial study; MRI and CT are indicated to refine the diagnosis. Concomitant injuries are common, including ligament tears, meniscal damage, and other soft-tissue compromise. Less common but more devastating injuries include vascular disruption, nerve injury, and compartment syndrome. Injury severity determines whether treatment will be nonoperative or operative, but the goal is to restore the patient's normal function.

Tibial plateau fractures are seen in all age-groups (although rarely in children), and their severity ranges from closed, nondisplaced, stable fractures to open, comminuted, unstable fractures. Patients who have substantial trauma may present acutely; others may attribute pain to a sprain or contusion and delay seeking medical attention. The diagnosis can be missed if a careful history, physical examination, and proper imaging and diagnostic studies are not obtained. The physician should be aware of and recognize potential concomitant injuries, some of which can be limb-threatening, especially if the patient delays seeking medical attention. We report a patient who was injured while playing softball and sought medical evaluation 1 week after injury.

Case Report

A 35-year-old man injured his left knee in a collision with a softball teammate while attempting to catch a fly ball in the outfield. He was able to walk off the field, but he could not return to play because of pain and swelling. Over the next 7 days, he had increasing pain and swelling, and, when his symptoms were unrelieved by rest, ice, and nonsteroidal anti-inflammatory medication, he sought help from an orthopedic surgeon.

History. The patient did not recall the exact mechanism of injury, but he believed the knee had hyperextended. He described an acute onset of lateral-side knee pain and continuing pain. The patient indicated he had refrained from playing sports since the incident, and he showed substantial

difficulty walking. He did not feel any mechanical symptoms, such as catching or locking, nor did he experience any instability. The patient had no previous injury to that knee, and his medical history was unremarkable.

Physical examination. The patient was ambulatory with an antalgic gait, but leg alignment was normal. He had tenderness on palpation over the lateral joint line, and he had a 3+ effusion. His knee range of motion was 0°/10°/90°. A Lachman's test and anterior and posterior drawer tests were negative. The knee showed no increased laxity to varus or valgus stress in full extension, and an apparent 2+ laxity to valgus stress at 30° of knee flexion. The neurovascular examination was normal and symmetric to the other lower extremity.

Imaging studies. Plain radiographs included a standing anteroposterior (AP) view of both knees, a lateral view of the affected knee, an axial view of the patella, and a notch view. Although an irregularity of the lateral tibial plateau was evident (figure 1), the radiographs were not diagnostic. Because the diagnosis was uncertain and the patient appeared to have some ligamentous laxity on physical examination, a magnetic resonance imaging (MRI) scan was recommended and obtained. The MRI showed a tibial plateau fracture with probable depression of the articular surface; the menisci, cruciate, and collateral ligaments appeared intact. Computed tomography (CT), obtained for a better definition of the bony architecture, showed a displaced, comminuted lateral tibial plateau fracture with an 8-mm depression of the largest fragment containing the articular surface (figure 2).

Figures: Courtesy of Edward G. McFarland, MD



FIGURE 1. Preoperative knee radiographs of a 35-year-old male recreational softball player. The anteroposterior (AP) view (A) shows an abnormality (arrow) of the lateral tibial plateau. The lateral view (B) appears unremarkable.

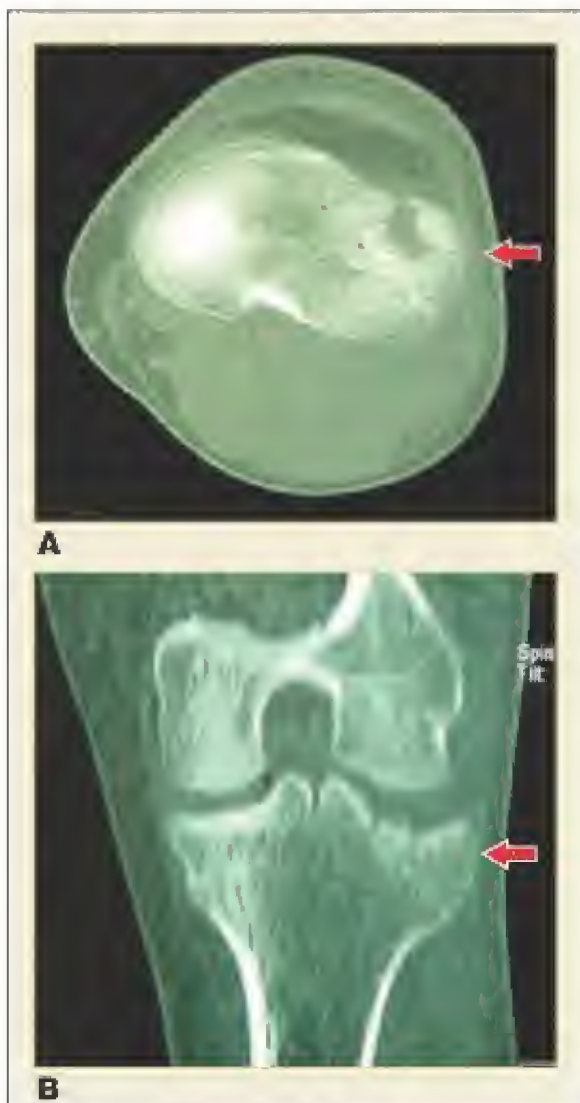


FIGURE 2. Preoperative axial CT scan (A) of the knee of the same patient reveals displacement of the lateral tibial plateau with depression of the articular surface (arrow). Coronal AP reconstruction CT image (B) shows a decompressed fragment of the lateral tibial plateau (arrow). Surgery was required to restore mechanical alignment.

Treatment and outcome. Based on the patient's age, activity level, and fracture classification (Schatzker type 2), surgery was recommended. A lateral approach was used for exposure, and the fracture was stabilized with a standard buttress plate and screws (figure 3). Postoperatively, the patient was placed in a splint with his knee in extension for 2 weeks. Knee mobilization in a hinged brace was allowed at 2 weeks, but the patient was instructed to avoid full weight bearing for 12 weeks, with progression from toe touch at 8 weeks. Full knee range of motion was achieved within 8 weeks, and the patient returned to playing sports by 6 months. He was encouraged to avoid high-impact sports to guard against potential long-term degenerative joint disease.

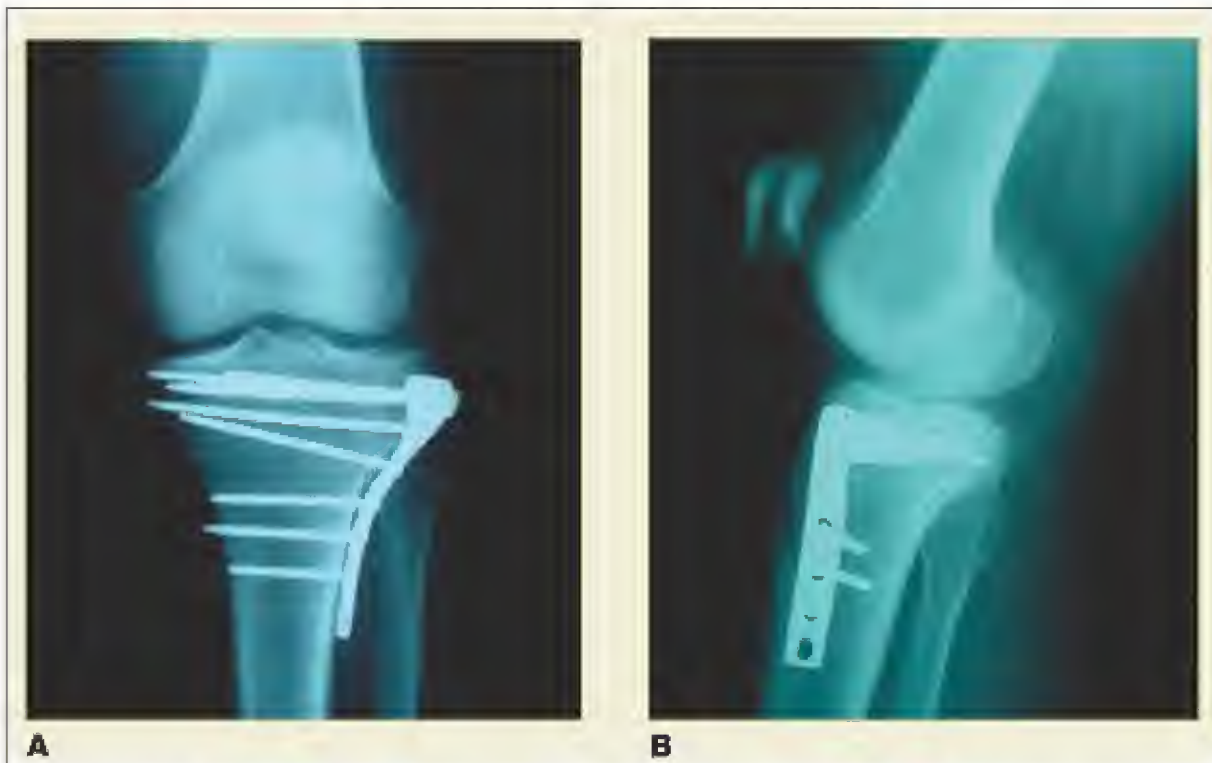


FIGURE 3. Postoperative AP (A) and lateral (B) radiographs of the knee of the same patient after operative reduction with internal fixation. After 8 weeks of non-weight bearing and 4 more weeks of gradual toe touch and rehabilitation, the patient had no further complications.

Touching All the Bases

Some tibial plateau fractures can be difficult to diagnose, especially if subtle findings on the ligamentous laxity exam make it difficult to distinguish between bony and ligamentous injury. Our patient underestimated the severity of his injury and sought medical care only when he failed to improve. Substantial pain, an antalgic gait, and a large effusion were all signs of a more serious injury.

The mechanism of injury of tibial plateau fractures involves a varus or valgus force combined with axial loading of the femur on the tibia.¹⁻³ With an axial load, the femur exerts both shearing and compressive forces on the tibial condyles, resulting in fracture.² Tibial plateau fractures typically occur after low-energy falls in the elderly^{1,3-5} or result from high-energy mechanisms, such as automobile accidents or sports injuries, in younger patients.^{2,5} Fractures of the medial plateau are more common with high-energy than low-energy injuries, and they have a higher incidence of associated injury, such as meniscal tears (up to 50%), collateral or cruciate ligament injury (up to 30%), nerve damage, vascular injury, knee dislocation, and compartment syndrome.^{1,2}

Classification. In general, classification systems allow fractures to be grouped in terms of mechanism of injury, fracture pattern, treatment options, and prognosis. The AO^{1,2,6} and Schatzker⁵ classifications are the most widely used systems for tibial plateau fractures. The categories are arranged in order of increasing injury severity and worsening prognosis.

Diagnosis. Patients who have tibial plateau fractures often report knee pain and swelling, and they are unable to bear weight.^{1,2} A complete history is important to assess the mechanism of injury, energy involved, and symptoms (eg, severity of pain, paresthesias). High-energy injury mechanisms should raise suspicion of other associated injuries.

Physical exam findings of tibial plateau fractures may not be distinctive, and a wide variety of diagnoses should be considered, including anterior cruciate ligament tear, posterior cruciate ligament tear, medial or lateral collateral ligament tears, meniscal injury, and bone or chondral contusion.

Tenderness, decreased knee range of motion, effusion, and soft-tissue swelling are not specific for

tibial plateau fractures. Tenderness over the joint line can suggest fracture, meniscal tear, or ligament injury. Evaluation should include the soft-tissue envelope, neurologic function, vascular status, and motor strength of the leg. Tight compartments, pain out of proportion to injury, and pain with passive stretch of the muscles may indicate compartment syndrome. Although arterial injury is uncommon with these fractures, we recommend that decreased pulses be evaluated with either ultrasound or arteriography.

Laxity to varus and valgus stress should be tested with the knee in full extension and at 30° flexion to assess knee stability. When testing varus and valgus and anterior and posterior stability, it is extremely important to have a neutral starting point. As shown in this case, tibial plateau fractures can mimic medial collateral ligament injuries on physical exam. This "pseudolaxity" is caused by depression of the fragment and not by a collateral ligament injury.

Initial imaging studies should include AP and lateral radiographs of the knee with the distal femur and proximal tibia visible. Internal and external oblique views and 15° caudal tilt (notch view) radiographs help characterize the fracture. Our patient's knee laxity suggested a medial collateral ligament injury, so an MRI was ordered first. After plain radiographs, CT remains the study of choice for defining fractures and the degree of fragment displacement. When evaluating proximal tibial plateau fractures with CT for additional information about configuration or displacement, we recommend sagittal and coronal reconstructions.

Treatment and prognosis. The goal of treatment for any intra-articular fracture is to preserve joint motion, joint stability, articular surface congruence, and axial alignment.^{2,3} The treatment of tibial plateau fracture depends on several factors, the most important of which is displacement. Other factors include patient age and activity level, fracture pattern, stability, and associated injuries. Nonoperative treatment is indicated for nondisplaced or minimally displaced fractures, stable intra-articular fractures, and fractures in patients who have substantial medical comorbidities.² Surgery is recommended when instability to varus or valgus stress exceeds 10°.⁷ Emergent surgical intervention is indicated for open fractures or those with associated compartment syndrome or vascular injuries.¹

Four factors are key to the prognosis of tibial plateau fracture: (1) degree of articular depression, (2) extent and separation of condylar fracture lines, (3) degree of diaphyseal-metaphyseal comminution and dissociation, and (4) integrity of the soft-tissue envelope.⁸ The amount of acceptable articular depression remains controversial and ranges from 4 to 10 mm.^{7,8} Long-term studies have not shown a correlation between joint depression and the development of arthrosis. Overall, poor results are found with joint instability and with loss of proper mechanical alignment.^{1,3,9}

Postoperative care. Controlled, early knee range of motion usually begins at 1 to 2 weeks for fractures with stable fixation.^{1,3} Ideally, full range of motion will be obtained within 8 to 12 weeks. The weight-bearing status is determined by several factors, including the degree of comminution, the security of the fixation, and patient compliance with directions. At our institution, weight bearing, even toe touch, in at-risk patients is prohibited until radiographic evidence of healing is seen (usually 6 to 8 weeks). Toe-touch weight bearing should be instituted first and should progress to partial and then full weight bearing as symptoms allow. Full weight bearing usually is achieved by 12 to 14 weeks.

Generally, return to sports should be restricted until the leg has regained full range of motion and strength. Because the articular surface frequently is damaged in a tibial plateau fracture, athletes should be advised of the possible increased long-term risk of arthritis with weight-bearing sports.

Staying on the Ball

Patients who sustain high-energy knee trauma may not seek treatment immediately, preferring to hope that painful symptoms are nothing serious. Clinicians who evaluate patients who have pain and swelling that has not resolved should be alert for fractures and concomitant soft-tissue injuries. If imaging studies reveal a tibial plateau fracture that requires surgery, patients should expect at least 12 weeks' recovery time. Further participation in high-impact sports may have to be curtailed to avoid the risk of further damage to the knee, and patients should be aware that arthritis is a future

possibility.

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Dr Anderson is a fellow, Dr Cosgarea is an associate professor and director, and Dr McFarland is an associate professor and vice chair of adult orthopedics, all in the division of sports medicine in the department of orthopedic surgery at The Johns Hopkins University in Baltimore. Mr Dawson is a physician assistant and a fourth-year medical student at West Virginia University School of Medicine in Morgantown, West Virginia. **Address correspondence to** Edward G. McFarland, MD, c/o Elaine P. Henze, Medical Editor, Dept of Orthopaedic Surgery, Johns Hopkins Bayview Medical Center, 4940 Eastern Avenue, #672, Baltimore, MD 21224-2780; e-mail to ehenze1@jhmi.edu.

Disclosure information: Drs Anderson, Cosgarea, and McFarland and Mr Dawson disclose no significant relationship with any manufacturer of any commercial product mentioned in this article. No drug is mentioned in this article for an unlabeled use.

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2 attachments



L. Charles Fink <charlie@lcfink.com>
 To: Edward McFarland <emcfarl1@jhmi.edu>

Wed, Dec 10, 2008 at 2:22 PM

Wow - one could say there are some very revealing photos of me on the Internet :)

Actually, I am very happy to have this. I have often wanted to share the x-rays of my leg w/ folks, and I had no way to get it digitally. I'll hang on to this!

Charlie

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—

Thanks,

Charlie

[703-869-9266](tel:703-869-9266)

Edward McFarland <emcfarl@jhmi.edu>

Thu, Dec 11, 2008 at 7:47 AM

To: "L. Charles Fink" <charlie@lcfink.com>

Cc: Anne Nicholas <NicholaA@staff.abanet.org>

Charlie

I am trying to do a stealth maneuver and when we leave the party pop it on Michele that we are staying in a hotel overnight with the kids so we can stay at your place later—however, the absolute requirement is that they have to have a pool. I tried the Ritz for fun but no pools. We also have to have 2 doubles and rollaway which the Ritz cannot do—do you know of any hotels that meet the bill offhand that are downtown or nearby? How about the Marriotte Grand or whatever?

Ed

>>> "L. Charles Fink" <charlie@lcfink.com> 12/10/2008 2:22 PM >>>

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 > [image: Menubar]
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 > here <<http://www.physsportsmed.com/issues/2005/0305/cme0305.htm>>.
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> director, and Dr McFarland is an associate professor and vice chair of adult

> orthopedics, all in the division of sports medicine in the department of

> orthopedic surgery at The Johns Hopkins University in Baltimore. Mr Dawson

> is a physician assistant and a fourth-year medical student at West Virginia

> University School of Medicine in Morgantown, West Virginia. *Address

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> ehenze1@jhmi.edu.

>

> *Disclosure information:* Drs Anderson, Cosgarea, and McFarland and Mr
 > Dawson disclose no significant relationship with any manufacturer of any
 > commercial product mentioned in this article. No drug is mentioned in this
 > article for an unlabeled use.
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 Thanks,
 Charlie
[703-869-9266](tel:703-869-9266)

L. Charles Fink <charlie@lcfink.com>

Thu, Dec 11, 2008 at 9:27 AM

To: Edward McFarland <emcfarl@jhmi.edu>

Cc: Anne Nicholas <NicholaA@staff.abanet.org>

Here are some options:

* [Embassy Suites](#)

Has an indoor pool, would be a short cab ride to our house. A quick check of availability for Sat. night seems positive, around \$155. The pictures of the indoor pool look nice.

* [Courtyard, Convention Center](#)

Indoor pool, short cab ride. Available rooms ~\$150.

* [Mariott Residence Inn, Capitol Hill](#)

Indoor pool, and Residence Inns are great with kids (kitchen and all that hoo-rah). ~10 minute cab ride. Available rooms/suites ranging from \$160-\$200

* [J. W. Marriott Downtown](#)

Expensive (~\$250 and up), but a great location if you want to do anything the next day...

Of all these, I think the Embassy Suites offers the best location/price/pool requirement balance. However, I have never been there, and as you know, I am not an expert on picking accommodations.

Here is another useful link I stumbled on:

* [Priceline Hotels Indoor Pool, Washington, DC](#)

I don't fully understand the pool requirement, but that's not for me to question. Just to through out a couple options:

* We have access to the YMCA, which has an indoor pool. You guys could go there on Sunday morning. Of course, that's not really a splash/kid pool...

* There is an awesome bed and breakfast near our house. Anne and I have walked through it, and discussed having you guys stay there. Here is the link:

[DC Guest House](#)

This place is amazing inside. They do have availability, and the prices are not crazy. Celebrities stay here, and the owners are very friendly. This is probably not the most kid-friendly destination, however.

If you want more info, or need help booking, give me a call at the office: [202-334-2781](tel:202-334-2781).

Awesome that you are staying!!

- C

[Quoted text hidden]

—

Thanks,
Charlie

[703-869-9266](tel:703-869-9266)

Nicholas, Anne <NicholaA@staff.abanet.org>

Thu, Dec 11, 2008 at 9:35 AM

To: "L. Charles Fink" <charlie@lcfink.com>, Edward McFarland <emcfarl@jhmi.edu>

Yea!!!! We're so happy that you'll be staying!!! Let us know if you need any help with any of these hotels –

Look forward to seeing you!

Anne

From: L. Charles Fink [mailto:charlie@lcfink.com]

Sent: Thursday, December 11, 2008 9:28 AM

To: Edward McFarland

Cc: Nicholas, Anne

Subject: Re: things you find on line! see you Sat

[Quoted text hidden]

Nicholas, Anne <NicholaA@staff.abanet.org>

Thu, Dec 11, 2008 at 9:36 AM

To: "L. Charles Fink" <charlie@lcfink.com>

Thanks for doing this, sw. You came up w/a great list!!!

A

From: L. Charles Fink [mailto:charlie@lcfink.com]

Sent: Thursday, December 11, 2008 9:28 AM

To: Edward McFarland

Cc: Nicholas, Anne

Subject: Re: things you find on line! see you Sat

Here are some options:

* [Embassy Suites](#)

[Quoted text hidden]

Edward McFarland <emcfarl@jhmi.edu>

Thu, Dec 11, 2008 at 2:50 PM

To: "L. Charles Fink" <charlie@lcfink.com>

Charlie

You are the man and this helps a lot.

I am going to call the Embassy Suites--is it in a good part of town?

Ed

>>> "L. Charles Fink" <charlie@lcfink.com> 12/11/2008 9:27 AM >>>

Here are some options:

* Embassy

Suites<[http://www.tripadvisor.com/ShowUserReviews-g28970-d84064-r21823691-Embassy Suites Hotel Washington D C-Washington DC District of Columbia.html](http://www.tripadvisor.com/ShowUserReviews-g28970-d84064-r21823691-Embassy_Suites_Hotel_Washington_D_C-Washington_DC_District_of_Columbia.html)>

Has an indoor pool, would be a short cab ride to our house. A quick check of

availability for Sat. night seems positive, around \$155. The pictures of the

indoor pool look nice.

* Courtyard, Convention

Center<<http://www.marriott.com/hotels/travel/wascn-courtyard-washington-convention-center/>>

Indoor pool, short cab ride. Available rooms ~\$150.

* Marriott Residence Inn, Capitol <<http://www.capitolmarriott.com/>>Hill

Indoor pool, and Residence Inns are great with kids (kitchen and all that

hoo-rah). ~10 minute cab ride. Available rooms/suites ranging from \$160-\$200

* J. W, Marriott

Downtown<<http://www.marriott.com/hotels/travel/wasjw-jw-marriott-hotel-washington-dc/>>

Expensive (~\$250 and up), but a great location if you want to do anything

the next day...

Of all these, I think the Embassy Suites offers the best

location/price/pool

requirement balance. However, I have never been there, and as you know,

I am

not an expert on picking accommodations.

Here is another useful link I stumbled on:

* Priceline Hotels Indoor Pool, Washington,

DC<<http://hotels.priceline.com/hotels/amenities-home/amenities-gateway/indoor-pool/indoor-pool-us-dc-washington.html>>

I don't fully understand the pool requirement, but that's not for me to

question. Just to through out a couple options:

* We have access to the YMCA, which has an indoor pool. You guys could go

there on Sunday morning. Of course, that's not really a splash/kid pool...

* There is an awesome bed and breakfast near our house. Anne and I have

walked through it, and discussed having you guys stay there. Here is the link:

DC Guest House <<http://www.dcguesthouse.com/Welcome.htm>>

[Quoted text hidden]

L. Charles Fink <charlie@lcfink.com>

Thu, Dec 11, 2008 at 3:18 PM

To: Edward McFarland <emcfarl@jhmi.edu>

Cc: "Nicholas, Anne" <NicholaA@staff.abanet.org>

Yeah - its a good part of town. Our house, on the other hand...

- C

[Quoted text hidden]

--

Thanks,

Charlie

[703-869-9266](tel:703-869-9266)

Edward McFarland <emcfarl@jhmi.edu>

Thu, Dec 11, 2008 at 5:34 PM

To: "L. Charles Fink" <charlie@lcfink.com>

got a spot at the embassy suites on 22nd or such

it is a surprise for Michele so don't leak it

might need to take a couple cabs!

Ed

>>> "L. Charles Fink" <charlie@lcfink.com> 12/11/2008 9:27:51 AM >>>

Here are some options:

* Embassy

Suites<http://www.tripadvisor.com/ShowUserReviews-g28970-d84064-r21823691-Embassy_Suites_Hotel_Washington_D_C-Washington_DC_District_of_Columbia.html>

Has an indoor pool, would be a short cab ride to our house. A quick check of

availability for Sat. night seems positive, around \$155. The pictures of the

indoor pool look nice.

* Courtyard, Convention

Center<<http://www.marriott.com/hotels/travel/wascn-courtyard-washington-convention-center/>>

Indoor pool, short cab ride. Available rooms ~\$150.

* Marriott Residence Inn, Capitol <<http://www.capitolmarriott.com/>>Hill

Indoor pool, and Residence Inns are great with kids (kitchen and all that

hoo-rah). ~10 minute cab ride. Available rooms/suites ranging from \$160-\$200

* J. W, Marriott

Downtown<<http://www.marriott.com/hotels/travel/wasjw-jw-marriott-hotel-washington-dc/>>

Expensive (~\$250 and up), but a great location if you want to do anything the next day...

Of all these, I think the Embassy Suites offers the best location/price/pool

requirement balance. However, I have never been there, and as you know, I am

not an expert on picking accommodations.

Here is another useful link I stumbled on:

* Priceline Hotels Indoor Pool, Washington, DC<<http://hotels.priceline.com/hotels/amenities-home/amenities-gateway/indoor-pool/indoor-pool-us-dc-washington.html>>

I don't fully understand the pool requirement, but that's not for me to

question. Just to throw out a couple options:

* We have access to the YMCA, which has an indoor pool. You guys could go there on Sunday morning. Of course, that's not really a splash/kid pool...

* There is an awesome bed and breakfast near our house. Anne and I have walked through it, and discussed having you guys stay there. Here is the link:

DC Guest House <<http://www.dcguesthouse.com/Welcome.htm>>

[Quoted text hidden]

L. Charles Fink <charlie@lcfink.com>

Wed, Feb 18, 2009 at 9:03 AM

To: "Young, William" <byoung@hunton.com>

Scroll down about half way....

- C

[Quoted text hidden]

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Thanks,
Charlie

[703-869-9266](tel:703-869-9266)

2 attachments

The McGraw-Hill Companies

noname
1K




noname
1K